

STUDIES ON MACQUARIE ISLAND LICHENS 2: THE GENERA HYPOGYMNNIA, MENEGAZZIA, PARMELIA AND PSEUDOCYPHELLARIA

by

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SUMMARY

The genera *Hypogymnia* and *Menegazzia* (Hypogymniaceae), *Parmelia* (Parmeliaceae) and *Pseudocypbellaria* (Lobariaceae) are enumerated. Two new species, *Parmelia lusitaniensis* R. Filson and *Parmelia phillipsiana* R. Filson, are described. Keys to species and varieties are given where applicable. A full description of each species is provided, together with discussion on affinities, chemical constituents and distribution.

HYPOGYMNNIA

Hypogymnia lugubris (Pers.) Krog, *Norsk Polarinst. Skr.* 144: 99 (1968).

Parmelia lugubris Pers. in Gaudich., *Voy. Uranie Bot.*, 196 (1828).

Thallus foliose or subfruticose, loosely attached to substrate, sometimes firmly held within moss cushions, pale grey with black lines and occasional black patches; lobes up to 3 mm wide, dichotomously or irregularly branched, sparsely imbricate; upper surface mat to shining, strongly wrinkled, without rhizines. *Apothecia* stipitate, up to 5 mm diam.; margin very thin, crenulate becoming lacerate; disk reddish-brown, shining, deeply concave at first becoming almost flat at maturity; *hypotheorium* hyaline; *hymenium* up to 45 μm tall; *paraphyses* 2 μm diam., apical cell expanded to 5 μm ; *asci* 8-spored, 30-36 \times 12-16 μm ; *ascospores* hyaline, ellipsoidal, simple, 8-9 \times 5-6 μm . *Pycnidia* not seen.

REACTIONS: Cortex K+ yellow; medulla K-, C-, KC+ red, P+ red.

CHEMISTRY: Atranorin, chloroatranorin, physodic acid, physodalic acid.

REPRESENTATIVE SPECIMENS EXAMINED (total seen 54, Fig. 7):

Hurd Point, R. Filson 6014 & P. Atkinson, 11.ii.1964 (MEL 1022202); 1.5 km north-west of Waterfall Bay, R. Filson 5759 & N. Barrett, 22.i.1964 (MEL 1022207); 1 km north of Aurora Point, R. Filson 6187 & R. Petersen, 20.ii.1964 (MEL 1022197); Half-way along the west side of Gratitude Lake, R. Filson 5933 & J. Phillips, 4.ii.1964 (MEL 1022201); North end of Plateau, N. Haysom Z61, 8.ii.1950 (MEL 7720); North of Mount Gwynn, R. Hnatiuk 11584, 30.xii.1971 (MEL 1024296); Featherbed flats, N. R. Laird, 1948 (MEL 7719); Mount Aurora, D. A. Parker, 12.x.1971 (MEL 1023740); Summit of Mount Elder, K. Simpson B28, 2.viii.1965 (MEL 26014); 500 metres south-west of Pyramid Peak, R. D. Seppelt 9945, 4.ii.1980 (MEL 1029361).

DISCUSSION:

Hypogymnia lugubris is one of the commonest lichens on Macquarie Island. It occurs both on the coastal fringe almost at sea level and on the mountains. In coastal habitats it grows amongst grasses, over small bushes and in crevices between rocks. It may be found in both exposed and sheltered aspects, from dry peaty areas on the featherbed to tops of the rock stacks. On the plateau it is common amongst grasses, it forms part of the cushions of *Azorella* and *Colobanthus* and also grows on bare rock.

This species is very polymorphic. Field observations indicate that the varieties

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Muelleria 4(4): 317-331 (1981).

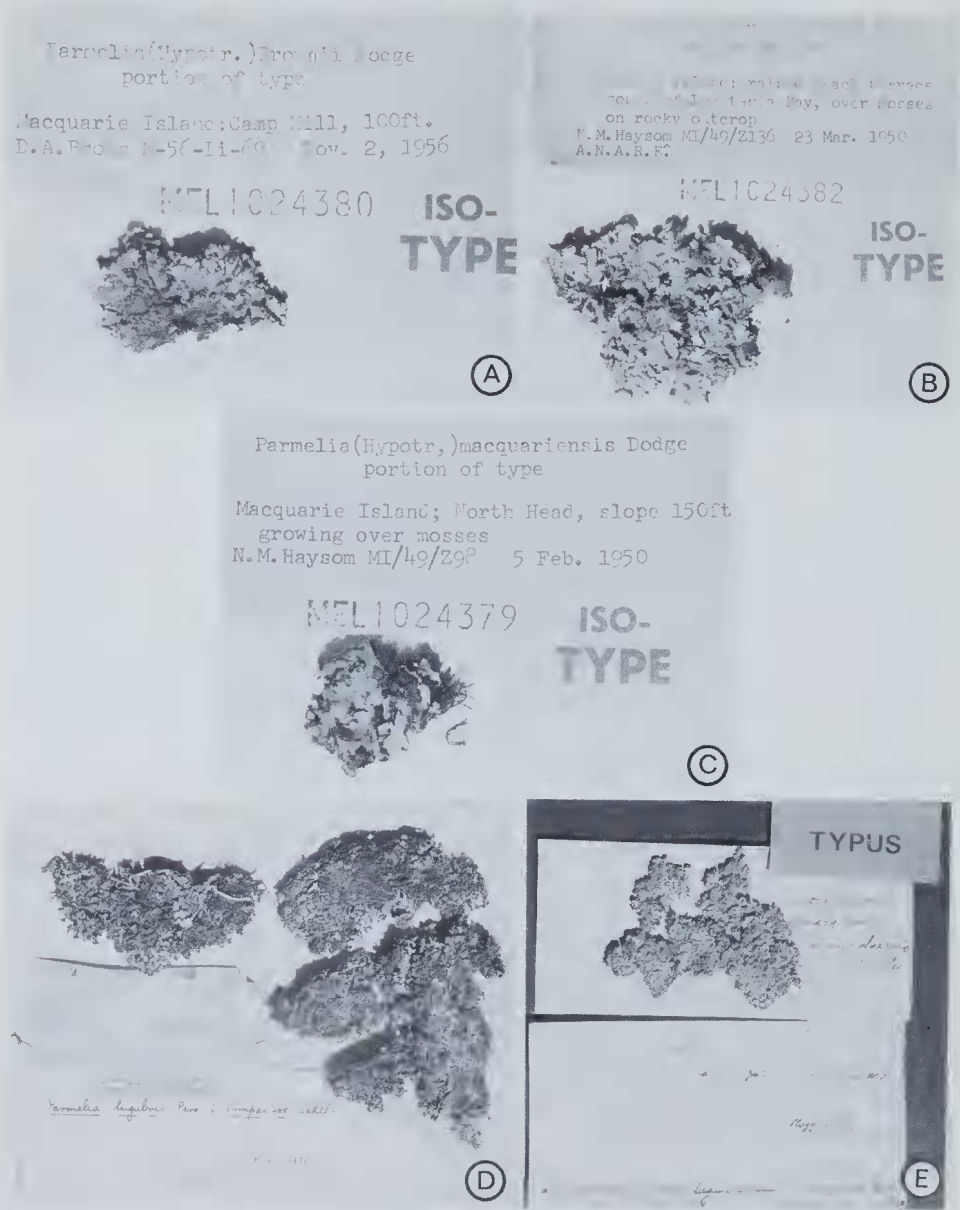


Fig. 1. a— isotype of *Parmelia brownii*; b— isotype of *Parmelia haysomii*; c— isotype of *Parmelia macquariensis*; d— isolectotype of *Parmelia lugubris* f. *compacta*; e— holotype of *Parmelia physodes* var. *compacta*.

lugubris, *compacta* and *sublugubris* keyed below are so variable that it is very difficult to obtain firm divisions between them.

KEY TO VARIETIES:

1. Thallus lobes densely branched; upper surface always with black markings

2. Thallus lobe apices generally brown, upper surface with sparse black markings *H. lugubris* var. *compacta*
 2. Thallus lobe apices rarely brown, upper surface with prominent black markings *H. lugubris* var. *sublugubris*
 1. Thallus lobes loosely branched, elongate; upper surface occasionally black marked. *H. lugubris* var. *lugubris*

var. **lugubris**

Thallus foliose, loosely attached to the substrate; lobes elongate, hardly imbricate, loosely branched.

var. **compacta** (Müll. Arg.) Dodge, Lichen Flora of the Antarctic Continent and Adjacent Islands, 205 (1973).

Parmelia physodes var. *compacta* Müll. Arg., *Nuovo G. Bot. ital.* 21: 39 (1889).

Type: Hogget Bay, Fuegiae, C. Spegazzini 1885 (G!) (Fig. 1E).

Hypogymnia lugubris var. *compactior* (Zahlbr.) Elix, *Brunonia* 2: 203 (1980).

Parmelia lugubris f. *compactior* Zahlbr. *Denkschr. Akad. Wiss., Wien*, 104: 110 (1941).

Type: Mount Pisgah, Central Otago J. S. Thomson 1477 (ZA215). (W. lectotype; CHR! isoelectotype). (Fig. 1D).

Thallus similar to var. *lugubris* differing in the imbricate, more crowded, irregularly branched lobes which are occasionally subfruticose, the upper surface consistently black marked and the ends of the lobes generally brown.

var. **sublugubris** (Müll. Arg.) Elix, *Brunonia* 2: 207 (1979).

Parmelia physodes var. *sublugubris* Müll. Arg., *Flora, Jena* 66: 75 (1883).

Parmelia sublugubris (Müll. Arg.) Dodge, *B.A.N.Z. Antarct. Res. Exped. 1929-1931 Rep. ser. B. Zool.-Bot.* 7: 188 (1948).

Thallus similar to var. *lugubris*, differing in being densely dichotomous with more prominent black markings or sometimes wholly blackened.

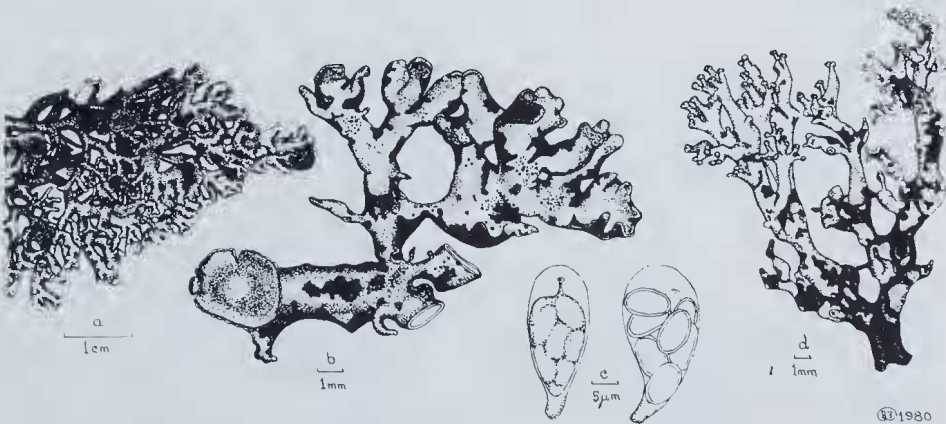


Fig. 2. *Hypogymnia lugubris*. a—habit of foliose form collected 500 m SW of Pyramid Peak; b—single lobe of same showing apothecium; c—asci and ascospores (a-c, MEL 1029361); d—lobe of fruticose form (var. *compacta*) collected at northern tip of Douglas Point (MEL 1022204).

MENEGAZZIA

Menegazzia sanguinascens (Räs.) R. Sant., *Ark. Bot.* 30A(11): 28(1942).

Parmelia sanguinascens Räs., *Suomal. elain-ja kasvit. Seur. van. Julk.* 2 (1): 18 (1932).

Menegazzia circumsoarediata sensu Dodge & Rudolph, *Ann. Mo. bot. Gdn.* 42: 142 (1955) non R. Sant. *Ark. Bot.* 30A(11): 14(1942).

Thallus foliose, saxicolous or corticolous, tightly appressed to the substrate, forming rosettes up to 10 cm diam.; lobes convex, margin rotund, up to 2 mm wide, hardly imbricate, perforate; perforations irregularly scattered; upper surface smooth or wrinkled, dull or slightly shining, whitish-grey to grey, sometimes blackening towards the centre, sorediose; soredia granular, concolourous with the thallus, or sometimes becoming grey, forming soralia up to 2 mm diam., originating from laminal globose pustules which eventually burst forming an opening into the central cavity, sometimes the centre of the thallus becomes a sorediose mat; lower surface black, dull to shining, strongly wrinkled; medulla compact, white in the upper parts blackening towards the central cavity; central cavity lined with a black medulla which becomes white or grey at the extreme lobe ends. Apothecia sessile or shortly stipitate up to 3 mm diam.; margin at first smooth and inrolled, becoming rugulose, later becoming sorediate, eventually completely dissolving in soredia; disk reddish-brown, concave, shining; hypothecium 30 μm thick in the centre of the apothecium; hymenium up to 150 μm tall; asci 93-105 \times 36 μm ; ascospores 39-54 \times 24-30 μm , up to 8 per ascus of which only one or two mature, simple, hyaline ellipsoidal.

REACTIONS: Thallus K + yellow, P – or P + pale yellow; medulla K + yellow becoming red, P + orange; soredia K + yellow becoming orange.

CHEMISTRY: Stictic, peristictic acids and atranorin.

REPRESENTATIVE SPECIMENS EXAMINED (total seen 34, Fig. 7):

Handspike Point, on rock outcrop at the end of the point, R. Filson 6315 & P. Atkinson, 11.iii.1964 (MEL 1023845); Hurd Point, about 2/3 distance out onto the peninsula, R. Filson 6002 & P. Atkinson, 10.ii.1964 (MEL 1024216); Coastal rocks north of Lusitania Bay, N. Haysom, 23.iii.1950 (MEL 7710); Mount Hamilton North, R. Hnatiuk 11552, 29.xii.1971 (MEL 1024283); North Head, radio mast, N. R. Laird, 7.ix.1948 (MEL 7715); North side of Square Lake, R. D. Seppelt 6081, 23.xi.1979 (MEL 1029373); Mouth of Flat Creek on side of rock stack c. 20-40 m north-east of beach, K. Simpson E26, 18.xi.1966 (MEL 1000282); Caroline Cove, c. 500 m inland between north and south arms of Caroline Creek, K. Simpson E58, 18.i.1966 (MEL 26007).

DISCUSSION:

This species was first described from Tierra del Fuego by Räsänen and later reported from Juan Fernandez, Chile, Patagonia (Santesson 1942: 29), South Georgia (Lindsay 1973: 108, 1974: 35) and New Zealand (Martin 1966: 147). Early collections of this species were previously determined as *M. circumsoarediata* R. Sant. by Dodge but that species differs from *M. sanguinascens* in the development of

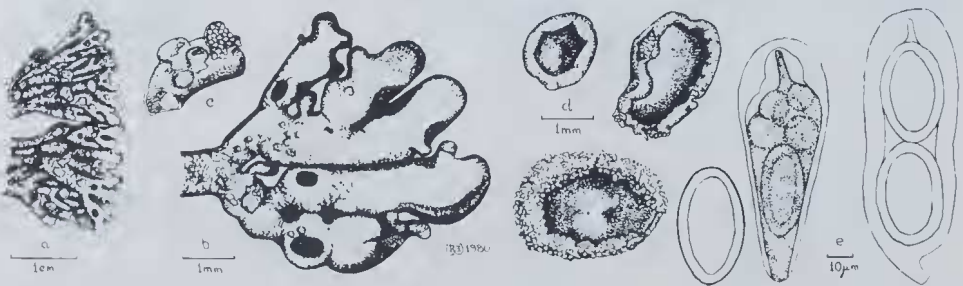


Fig. 3. *Menegazzia sanguinascens*. a—habit; b—marginal lobe; c—portion of lobe showing development of globose soralia; d—three stages in development of soredia on the apothecia; e—development of ascospores within the ascus, one mature spore on left. All from specimen collected 1 km north of Aurora Point, R. Filson 6185 & R. Petersen, 20.ii.1964, MEL 1023845.

the soredia. In *M. circumsorediata* the soredia develop around the margins of the perforations whilst in *M. sanguinascens* they develop from independent laminal pustules. Santesson (1942: 31) describes this species as occurring in the Fuegian forests and shrublands where it is corticolous in the densest *Chilotrichum* communities. Lindsay (1973: 109) says that in South Georgia it occurs on rock and over *Colobanthus* cushions at low altitudes near the shore in non-enriched habitats. On Macquarie Island it occurs on rocks near the shore and on the seaward side of outcrops at the edge of the plateau, over moss and *Colobanthus* cushions on the rocky outcrops in the featherbed, and on wood, i.e. the old radio mast which was erected by Sir Douglas Mawson in 1930 on North Head.

PARMELIA

1. Thallus with soredia or isidia
 2. Thallus sorediose
 3. Thallus pustulate sorediose
 4. Thallus yellow green *P. haysomii*
 4. Thallus pale grey to mineral grey *P. labrosa*
 3. Thallus not pustulate sorediose
 5. Soredia laminal
 6. Undersurface black with brown zone at margins of lobes, upper surface not reticulately ridged or pseudocyphellate
 7. Upper surface wrinkled, not pruinose, medulla K - *P. texana*
 7. Upper surface dull, smooth, pruinose, medulla K + *P. lusitaniensis*
 6. Undersurface black to margin, upper surface reticulately ridged becoming pseudocyphellate and sorediose *P. sulcata*
 5. Soredia marginal capitate
 8. Lobes > 3 mm wide, soralia labriform *P. macquariensis*
 8. Lobes < 3 mm wide, soralia pulvinate *P. brevirhiza*
 2. Thallus isidiöse
 9. Thallus green to yellow-green *P. phillipsiana*
 9. Thallus brown to greenish-brown *P. waiporensis*
1. Thallus without soredia or isidia *P. signifera*

Parmelia brevirhiza Kurok., *Contr. U. S. natn. Herb.* 36: 166(1964).

Hypotrachyna brevirhiza (Kurok.) Hale, *Smithson. Contr. Bot.* 25: 26(1975)

Type: Chile, Isla Riesco, Mina Elena, Terr. Magallanes. R. Santesson 2066, 29.iv.1940 (S).

Thallus foliose, saxicolous or muscicolous, loosely attached to the substrate, pale grey to mineral grey, ends of the lobes becoming dark grey; lobes dichotomous, truncate at the apices, up to 1 mm wide and 3 mm long, marginal lobes becoming erect, without cilia; *upper surface* smooth, dull to slightly shining, maculate in part; upright ends of the lobes becoming soraliolate, finally forming a large capitate, pulvinate soralium; *lower surface* jet black with a bare brown zone at the ends of non-soraliolate lobes, densely rhizinate; rhizines simple or strongly dichotomous; *medulla* white. *Apothecia* not seen.

REACTIONS: Thallus K+ yellow; medulla K+ yellow becoming red, C-, KC-, P+ orange.

CHEMISTRY: Atranorin, salacinic acid.

SPECIMEN EXAMINED (Fig. 7):

Handspike Corner, R. D. Seppelt 9344, 1.i.1980 (MEL 1029371).

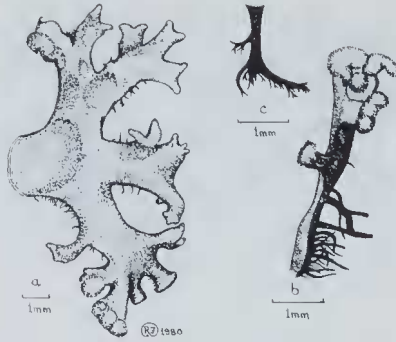


Fig. 4. *Parmelia brevirhiza*. a—marginal lobe showing habit; b—lobe showing capitate, pulvinate soralia; c—dichotomous, fasciculate rhizine. All from MEL 1029371.

DISCUSSION:

This species is distinguished by the long narrow lobes with capitate, pulvinate soralia.

Parmelia haysomii Dodge, *Nova Hedwigia* 15: 293(1968) [as '*P. haysomii*?].

Type: Macquarie Island, raised beach terrace south of Lusitania Bay, over mosses on rocky outcrop, *N. M. Haysom* Z136, 23.iii.1950 (holotype, herb. Dodge; isotype! MEL 1024382) (Fig. 1B).

Thallus foliose, loosely to moderately attached to the substrate, pale straw-coloured to light yellow-green, up to 15 cm diam.; lobes irregular, rotund at the apices, up to 3 mm wide, strongly imbricate, secondary lobes sometimes building up the thallus into a mat, without cilia; upper surface dull to slightly shining, without isidia, smooth at the margins, becoming pustulate towards the centre; pustules sometimes bursting to form granular soredia; under surface jet black with pale brown zone at the margins of the lobes, sparsely rhizinate; rhizines black in the centre of the thallus sometimes becoming pale towards the margins; medulla white. *Apothecia* not seen.

REACTIONS: Thallus K—; medulla K—, C—, KC—, P+ orange-red.

CHEMISTRY: Usnic, protocetraric and caperatic acids.

REPRESENTATIVE SPECIMENS EXAMINED (total seen 12, Fig. 7):

Outcrops on beach at north-eastern corner of Cape Star, *R. Filson* 6065 & *P. Atkinson*, 12.ii.1964 (MEL 34972); Outcrops in featherbed c. 1 km north of Aurora Point, *R. Filson* 6186 & *R. Petersen*, 20.ii.1964 (MEL 34973); Raised beach terrace south of Lusitania Bay, *N. M. Haysom* Z136, 23.iii.1950 (MEL 1024382); Handspike Corner, on rock stack, *R. D. Seppelt* 7339, 1.i.1980 (MEL 1029366); Coastal cliffs 1 km north-east of Mount Jeffreys, *R. D. Seppelt* 7506, 17.i.1980 (MEL 1026484).

DISCUSSION:

Parmelia haysomii is a common species in New Zealand and Australia. It is closely related to *Parmelia caperata* (L.) Ach., with which it is often confused, but differs in the more yellow-green appearance, the smaller lobes and the persistent pustules which only sometimes burst to form soredia.

On Macquarie Island it occurs mostly over mosses or on bare rock on the rock stacks in the featherbed and on the adjacent cliffs.

Parmelia labrosa (Zahlbr.) Hale, *J. Jap. Bot.* 43: 325(1968).

Parmelia tenuirima var. *labrosa* Zahlbr. *Denskschr. Akad. Wiss., Wien* 104: 356 (1941).

Pseudoparmelia labrosa (Zahlbr.) Hale, *Phytologia* 29: 190(1974).

Thallus foliose, saxicolous, closely appressed to the substrate, pale grey to mineral grey, becoming darker or brownish-grey at the lobe ends; lobes rotund at the apices, up to 3 mm wide, imbricate, without cilia; *upper surface* shining, smooth to wrinkled, maculate, without isidia, sorediate; soredia originating from pustules, becoming pustular soraliate on the ridges and margins of the thallus; *lower surface* jet black, with dark brown, bare zone at the margins of the lobes, rhizinate; rhizines simple or dichotomous; *medulla* white. *Apothecia* not seen.

REACTIONS: Thallus K + yellow; medulla K -, C + red, KC + red, P -.

CHEMISTRY: Lecanoric acid, atranorin.

SPECIMENS EXAMINED (Fig. 7):

In small gorge 500 m east of Bauer Bay hut, on cliffs at edge of creek, *R. D. Seppelt* 9733, 8.i.1980 (MEL 1029370); Sandell Bay, *R. D. Seppelt* 9883, 4.ii.1980 (MEL 1029372).

DISCUSSION:

Parmelia labrosa differs from the other small-lobed grey *Parmelia* species in that the soredia originate from pustules, which eventually form pustulate soralia. It is the only *Parmelia* species as yet found on Macquarie Island which reacts C + red, containing lecanoric acid.

Parmelia lusitaniensis R. Filson sp. nov.

Thallus in substrato modice adhaerens, saxicolous et muscicolous; superficies superior laevis, pruinosa, sorediata, sorediis granularibus, soralia tandem pulvinata, insida et cilia nulla, medulla alba; superficies inferior nigra. Thallus atranorinum et acidum salacinicum continens.

HOLOTYPE: Lusitania Bay, Macquarie Island, *Rex Filson* 5975 & *Philip Atkinson*, 10.ii.1964 (MEL 1023837).

Thallus foliose, saxicolous and muscicolous, loosely attached to the substrate, forming rosettes up to 4.5 cm diam., pale buff to greyish-buff, becoming darker on older parts of the thallus; lobes rotund, crisped, imbricate, up to 6 mm wide, without cilia; *upper surface* dull, smooth, pruinose, without isidia, sorediose; soredia granular, laminal, developing from soralia to large pulvinate clumps; sometimes small colonies appear to be esorediose; *lower surface* jet black with a broad dark brown zone at the lobe ends; rhizines thick, black, simple or dichotomous; *medulla* white. *Apothecia* not seen.

REACTIONS: Thallus K + yellow; medulla K + yellow becoming brownish orange, C -, KC -, P + golden orange.

CHEMISTRY: Salacinic acid, atranorin.

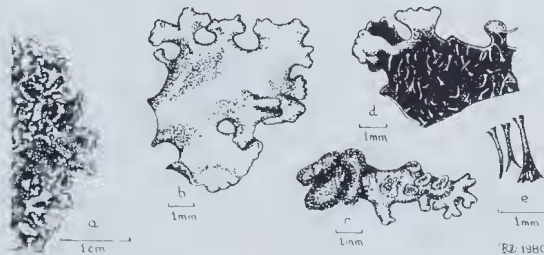


Fig. 5. *Parmelia lusitaniensis*. a—portion of thallus showing habit; b—marginal lobe; c—lobe showing pustular formation of soralia; d—undersurface; e—simple, dichotomous and fasciculate rhizines. All from holotype.

DISCUSSION:

The species is known only from the type collection.

Morphologically *Parmelia lusitaniensis* is very similar to *P. texana* differing in the upper surface being smooth, less sorediate and becoming pruinose at the lobe ends. It can easily be separated from *P. texana* by the chemical reaction of KOH on the medulla.

***Parmelia macquariensis* Dodge, *Nova Hedwigia* 19: 450(1970).**

Type: Macquarie Island, North Head, slope 150 ft, growing over mosses, *N. M. Hayson* Z98, 5.ii.1950 (holotype, herb. Dodge; isotype! MEL 1024379) (Fig. 1C).

Thallus foliose, loosely to moderately attached to the substrate, pale whitish-grey to buff; lobes irregularly rotund, up to 12 mm wide, margins crenulate, slightly imbricate, ciliate; cilia black, simple, up to 1 mm long; upper surface dull, smooth at margins, becoming rugulose and cracked towards the centre, finely maculate, sometimes pruinose, without isidia, sorediate; soralia marginal, labriform, becoming dark grey to blackish-grey; lower surface black, shining, wrinkled, rhizinate; rhizines black, simple or dichotomous; margins bare, dark brown; medulla white. *Apothecia* not seen.

REACTIONS: Thallus K+ yellow; medulla K+ yellow becoming red to dirty brown, C-, KC-, P+ orange.

CHEMISTRY: Salacinic acid, atranorin.

REPRESENTATIVE SPECIMENS EXAMINED (total seen 13, Fig. 7):

2 km north of Bauer Bay, on rock outcrops c. 6 m above the featherbed, *R. Filson* 5838, 28.i.1964 (MEL 34976); Outcrops in the featherbed 1 km north of Aurora Point, *R. Filson* 6189 & *R. Petersen*, 20.ii.1964 (MEL 1024222); Coastal cliffs 1 km south-east of Mount Aurora, *R. D. Seppelt* 7507, 16.i.1980 (MEL 1026483); Camp Hill, Isthmus, *K. Simpson* E94, 19. iii. 1966 (MEL 1000276).

DISCUSSION:

This species appears at first to be related to *Parmelia reticulata* Tayl.; however, the maculae are not reticulately arranged and they do not develop into pseudocyphellae. The rhizines are simple or dichotomous whereas those of *P. reticulata* are squarrosely branched.

***Parmelia phillipsiana* R. Filson sp. nov.**

Thallus arcte adnatus, saxicolus; superficies superior laevis, isidiata, isidiis cylindricis, ramosisque, coralloidibus, usque ad 2 mm longis, medulla alba; superficies inferior fusca ad centrum thalli nigrescens. *Thallus* acida continens: usnicum, sticticum, consticticum et norsticticum (vix adest).

Holotype: Cliffs on the western side of Macquarie island, c. 1 km south of Double Point, *R. Filson* 5904 & *J. Phillips*, 3.ii.1964 (MEL 1024224).

Thallus foliose, closely adnate to the substrate, up to 6 cm diam., pale yellowish-green with narrow brownish-black zone at the lobe margins; lobes narrow, rotund at the apices, 0.5 to 1 mm wide, contiguous, without cilia; upper surface smooth, slightly shining, sparsely maculate, without soredia, densely isidiate; isidia cylindrical, coralloid, small and simple near the margins, becoming taller (up to 2 mm) and branched towards the centre; lower surface dark brown to black with sparse simple rhizines right to the margins of lobes; medulla white. *Apothecia* not seen.

REACTIONS: Medulla K+ pale yellow, C-, KC-, P+ brick-red.

CHEMISTRY: Stictic, constictic, usnic acids, trace of norstictic acid.

SPECIMEN EXAMINED (Fig. 7):

Northwest of Handspike Corner, *R. D. Seppelt* 7361, 1.i.1980 (MEL 1029375).

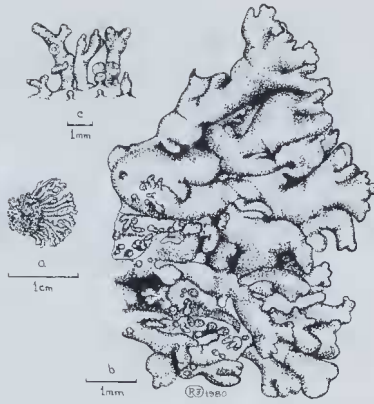


Fig. 6. *Parmelia phillipsiana*. a—portion of thallus showing habit; b—marginal lobes; c—isidia. All from holotype.

DISCUSSION:

Only two yellow-green species of *Parmelia* have been collected on Macquarie Island, *P. phillipsiana* and *P. haysomii*. *P. haysomii* is distinguished by its wide lobes and pustulate soredia and negative reaction of KOH on the medulla. *P. phillipsiana* is sparsely isidioid at the margins becoming densely isidioid in the centre of the thallus and reacts K + pale yellow on the medulla. This species is similar to the Australian species *Parmelia mougeotina* Nyl. but differs from this species in having shorter more convex, contiguous lobes and tall dense coralloid isidia.

Parmelia signifera Nyl. *Lich. Nov. Zel.*, 25(1888)

Thallus foliose, saxicolous, loosely attached to the substratum, pale brown to olive-grey becoming more brown at the lobe ends; lobes irregular, rotund at the apices, up to 10 mm wide, strongly imbricate, without cilia; secondary lobes building up the thallus into a thick mat; upper surface dull, flat, without soredia or isidia, heavily pseudocyphellate; pseudocyphellae never forming soredia; lower surface jet black with a brown zone at lobe ends; centre of thallus densely rhizinate with rhizines right to margins of lobes; rhizines simple or squarrosely branched; medulla white. *Apothecia* not seen.

REACTIONS: Thallus K + yellow; medulla K + yellow becoming red to blackish-red, C -, KC -, P + yellow becoming orange.

CHEMISTRY: Atranorin, salacinic acid.

SPECIMENS EXAMINED (Fig. 7):

Mount Haswell, R. Filson 6025 & P. Atkinson, 12.ii.1964 (MEL 30249); Featherbed Terrace, off north-western slopes of plateau, N. Laird, 1948 (MEL 7736).

DISCUSSION:

This species has only been recorded twice on the island, from the extreme north on the featherbed near Handspike Corner and from the northern slopes of Mount Haswell at the south end. It most certainly should occur between these two localities. *P. signifera* occurs frequently in Australia and New Zealand where it is often found with apothecia; neither of the Macquarie Island specimens are fertile.

Parmelia sulcata Tayl. apud Mack., *Fl. Hibern.* 2: 145(1836).

Parmelia brownii Dodge, *Nova Hedwigia* 19: 449(1970).

Type: Macquarie Island, Camp Hill, 100 ft., *D. A. Brown* 69, 2.xi. 1956 (holotype herb. Dodge; isotype! MEL 1024380) (Fig. 1A).

Thallus foliose, saxicolous and muscicolous, loosely to moderately attached to the substrate, forming patches up to 60 mm diam., pale brownish-buff to olive-grey with darker brown band at the lobe ends; lobes irregular, rotund at the apices, up to 6 mm wide, contiguous, sometimes slightly imbricate, without cilia; upper surface dull to slightly shining, without isidia, reticulately ridged; ridges becoming maculate then pseudocyphellate; pseudocyphellae finally bursting and then becoming sorediate; lower surface jet black right to the margin of lobes, dull to slightly shining, densely rhizinate right to margin of lobes; rhizines black, simple or dichotomous; medulla white. Apothecia not seen.

REACTIONS: Thallus K + yellow; medulla K + yellow becoming blood-red to black, C -, KC -, P + orange.

CHEMISTRY: Atranorin, salacinic acid.

SPECIMENS EXAMINED (Fig. 7):

Outcrop in the featherbed 2 km north of Bauer Bay, *R. Filson* 5822, 28.i.1964 (MEL 1024221); Outcrop in the featherbed 1 km north of Aurora Point, *R. Filson* 6186a & *R. Petersen*, 20.ii.1964 (MEL 1023838); Nuggets Point, *R. Filson* 6347, & *R. Petersen*, 18.iii.1964 (MEL 1023846); Featherbed terrace, north end of the island, *N. R. Laird*, 20.viii.1948 (MEL 7728).

DISCUSSION:

Parmelia sulcata is a very distinctive lichen which forms large patches on rock on the coastal rock stacks. The lobes are covered in deeply cracked pseudocyphellae which soon become sorediate and then distorted.

Parmelia texana Tuck., *Amer. J. Sci. Arts* ser. 2, 25:424 (1858)

Pseudoparmelia texana (Tuck.) Hale, *Phytologia* 29:191 (1974).

Thallus foliose, saxicolous and muscicolous, loosely to moderately attached to the substrate, forming small patches up to 10 cm diam., pale greyish-white to buff, margins and lobe-ends darker; lobes irregularly rotund at the apices, up to 6 mm wide, slightly imbricate, without cilia; upper surface dull to slightly shining, without isidia, smooth to wrinkled; wrinkles becoming sorediate; soredia coarse, granular, laminal, sometimes covering the centre of the thallus; lower surface jet black, with a very narrow brown zone at the lobe ends; rhizines black or pale, simple; medulla white. Apothecia not seen.

REACTIONS: Thallus K + yellow; medulla K -, C + rose-red, KC + rose-red, P -.

CHEMISTRY: Divaricatic acid, atranorin.

SPECIMENS EXAMINED (Fig. 7):

Lusitania Bay, *R. Filson* 5974 & *P. Atkinson*, 10.ii.1964 (MEL 1024218); Gadgets Gully, *R. Filson* 6361 & *R. Petersen*, 18.iii.1964 (MEL 1023847).

DISCUSSION:

Parmelia texana may be confused with both *P. suicata* and *P. lusitaniensis*, but it may be separated from both of these species in being far more sorediose and in the negative reaction of KOH on the medulla. The upper surface never becomes pseudocyphellate as does *P. sulcata*. It differs from *P. lusitaniensis* in having a wrinkled upper surface which soon becomes sorediose while the ends of the lobes never become pruinose.

Parmelia waiporiensis Hillm., *Reprum nov. Spec. Regni veg.* 45: 173(1938).

Neofuscelia waiporiensis (Hillm.) Essl., *Mycotaxon* 7: 53 (1978).

Thallus foliose, saxicolous, closely appressed to the substrate, yellowish-brown



Fig. 7. Known distribution of *Hypogymnia*, *Menegazzia* and *Parmelia* on Macquarie Island.

to greenish-brown to dark brown; lobes short and rounded, up to 3 mm wide, strongly imbricate, without cilia; upper surface smooth to wrinkled, dull to slightly shining, without soredia, isidiate; isidia inflated, globular, pustular, forming pulvinate patches in centre of thallus; lower surface black, dull to slightly shining, with a smooth dark brown zone at the lobe ends, moderately rhizinate; rhizines black, simple. *Apothecia* not seen.

REACTIONS: Thallus HNO_3 + dark blue-green; medulla K -, C -, KC + rose-red, P -.

CHEMISTRY: glomelliferic, glomellic, loxodellic acids.

SPECIMEN EXAMINED (Fig. 7):

North-west of Handspike Corner, 50 m from sea, on rock, *R. D. Seppelt* 7350, 1.i.1980 (MEL 1029374).

DISCUSSION:

P. waiporiensis is the only species of brown *Parmelia* so far found on Macquarie Island. It was previously collected at Handspike Point by D. McVean in December 1968 (Esslinger 1977: 156).

PSEUDOCYPHELLARIA

Pseudocypbellaria delisea (Fée in Del.) Galloway and P. James, *Lichenologist* 12: 297 (1980).

Sticta delisea Fée in Del. *Hist. Lich.*, *Sticta*, 94(1822).

Thallus foliose, saxicolous or muscicolous, up to 30 cm diam., loosely to firmly attached to the substrate, pale brownish-yellow to olive to pale reddish-brown; lobes irregular, rotund at the apices, entire, crenulate, lacerate or deeply incised, contiguous or imbricate; upper surface smooth or reticulately ridged, shining, without soredia, sometimes lobulate sometimes isidiate; lobules dorsiventral, divided at the apices, concolourous with the thallus; isidia terete, slightly flattened, or inflated towards the apices; lower surface black, dull to slightly shining, densely covered with fasciculate rhizines, pseudocypbellate; pseudocypbellae white; margins of lobes usually smooth, bare, pale brown or buff, conspicuously pseudocypbellate; medulla white or pale brownish-buff. *Apothecia* up to 5 mm diam.; margin thin, crenulate or incised, strongly inrolled at first; disk cinnamon-brown becoming reddish-black, deeply concave; hymenium up to 120 μm tall; asci 78-90 \times 15-19 μm ; ascospores 24-27 \times 8-10 μm , two-celled, hyaline, slightly pointed at each end. *Pycnidia* not seen.

REACTIONS: Thallus K -; medulla K + pale greenish-yellow becoming yellowish-brown, C -, KC -, P + red.

CHEMISTRY: Norstictic, stictic, peristictic, constictic and usnic acids, 7 β acetoxyhopan-22-ol, hopan-15 α , 22-diol and unknown triterpenes (Fig. 9).

REPRESENTATIVE SPECIMENS EXAMINED (total seen 35, Fig. 8):

Top of escarpment above Handspike Point, *R. Filson* 6331 & *P. Atkinson*, 11.iii.1964 (MEL 1024271); North-east corner of Lake Flynn, *R. Filson* 5872 & *J. Phillips*, 3.ii.1964 (MEL 1024260); Raised beach terrace north of Lusitania Bay, *N. Haysom* 2134, 23.iii.1950 (MEL 7704); Near the track north-west of Mount Gwynn, *R. Hnatiuk* 11586, 30.xii.1971 (MEL 1024295); Pyramid Peak, *R. D. Seppelt* 10243, 26.ii.1980 (MEL 1029362); Mouth of Flat Creek on side of rock stack about 20-40 m from north-east of beach, *K. Simpson* E28, 18.xi.1966 (MEL 1000278); Peak of hill on ridge above and north of Caroline cove, *K. Simpson* E76a, 20.i.1966 (MEL 26018); Along the escarpment between Mount Jeffreys and Mount Aurora, *D. A. Parker*, 18.x.1971 (MEL 1023774); Top of Gadgets Gully, *R. Waterhouse* A99, 11.iv.1972 (MEL 1020913).

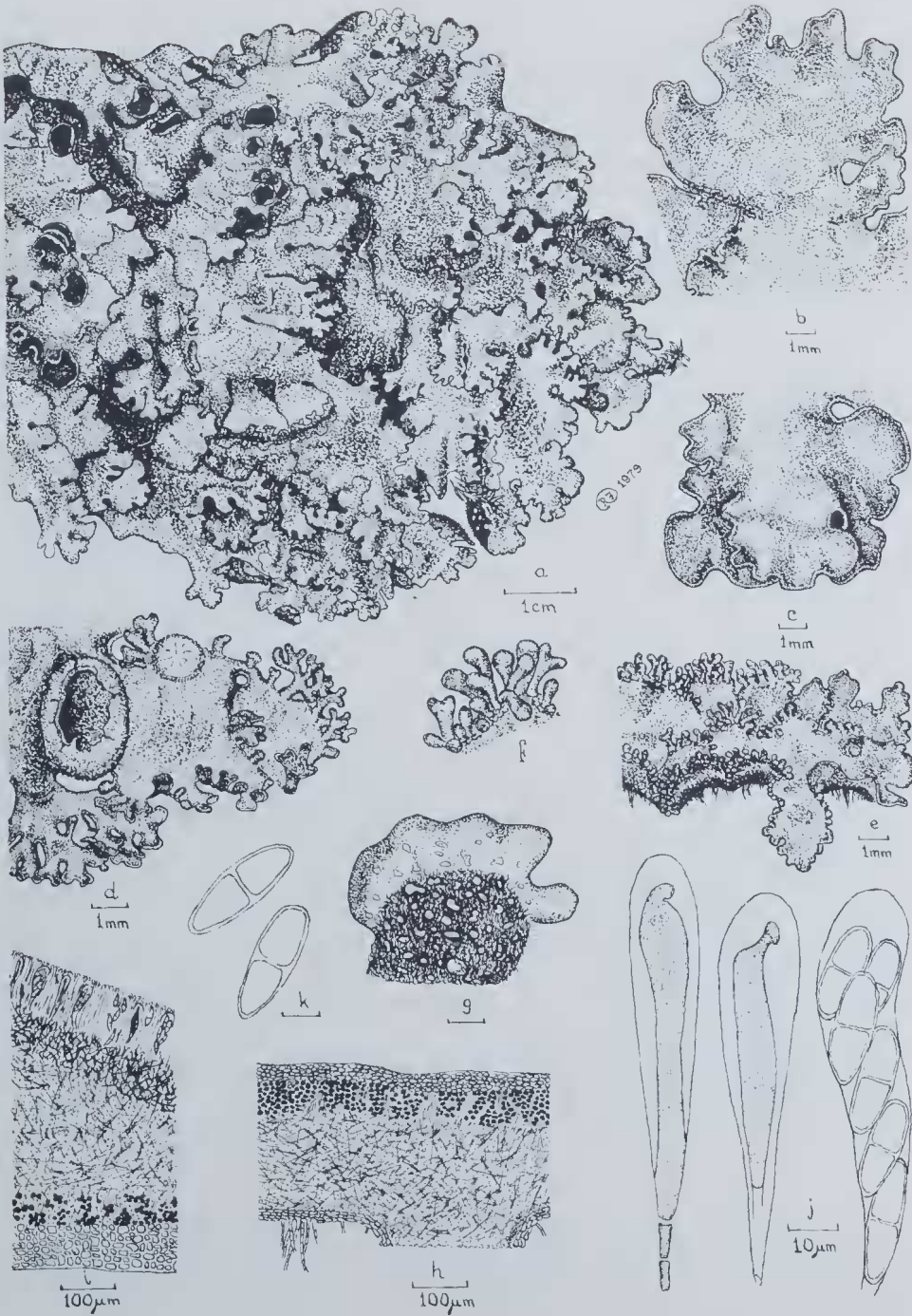


Fig. 10. *Pseudocyphellaria delisea*. a—habit (MEL 1024264). b—broad lobe (MEL 1024258). c—narrow imbricate lobe (MEL 1000435). d—lobe with apothecia and lobules (MEL 1024265). e—lobe with cylindrical isidia. f—enlargement of isidia (e-f, MEL 1024274). g—underside of lobe (MEL 1024262). h—section through the thallus; i—section through apothecium. j—three stages in development of ascus. k—ripe spores (h-k, MEL 1024263).



Fig. 8. Known distribution of *Pseudocyphellaria delisea* on Macquarie Island.

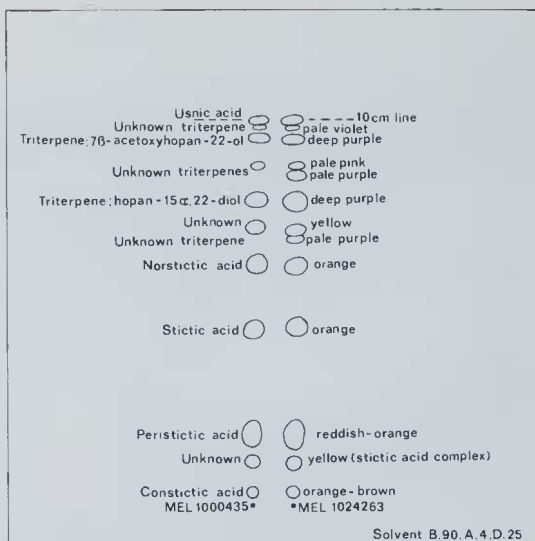


Fig. 9. Copy of Thin Layer Chromatograph showing products found in *Pseudocyphellaria delisea*. B, benzine; A, acetic acid; D, dioxane.

DISCUSSION:

This species grows in a variety of habitats; most commonly it is found growing amongst grasses or over *Colobanthus* and *Azorella* cushions, but it often occurs amongst mosses and on bare rock. It is extremely variable and several distinct forms can be separated from the population including forms with broad, hardly imbricate, contiguous lobes (Fig. 10b), those with narrow deeply channelled or flat imbricate lobes (Fig. 10c) and forms intermediate between these two. Some forms are isidiate (Fig. 10e) or lobulate (Fig. 10d), some are isidiate and the isidia become branched and dorsiventral and resemble lobules (Fig. 10f), while on some the isidia and lobules are so sparse that they appear to be devoid of these features. The undersurface (Fig. 10g) at the centre part of the thallus is usually black but the colour varies towards the ends of the lobes; here it may become dark brown to almost black or any shade between this and pale buff.

The overall colour of the thallus is also variable. It is mostly a shade of brownish-yellow but in some situations the ends of the lobes become reddish-brown to dark brown. In exposed habitats the central parts of the thallus often blacken.

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